

WHAT IS CLAIMED IS:

1. An environmental control system for an aircraft comprising:

means for receiving air external to the aircraft;

means for compressing said external air to a desired pressure; and

means for cooling said compressed air to a desired temperature.

2. An environmental control system according to claim 1, wherein said cooling means comprises a vapor compression cycle loop.

3. An environmental control system according to claim 1, wherein said vapor compression cycle loop includes evaporation means for removing heat from said compressed air.

4. An environmental control system according to claim 3, wherein a refrigerant flows through said loop and heat from said compressed air is transferred to said refrigerant in said evaporation means.

5. An environmental control system according to claim 4, wherein said loop further includes means for compressing said refrigerant exiting said evaporation means.

6. An environmental control system according to claim 5, further comprising said external air compression means comprising a first compressor, said refrigerant compressing means comprising a second compressor, and means for driving said first and second compressors.

7. An environmental control system according to claim 6, wherein said driving means comprises a turbine and means for supplying engine bleed air to said turbine.

8. An environmental control system according to claim 7, further comprising said first and second compressors and said turbine being located on a single shaft.

9. An environmental control system according to claim 5, wherein said loop further includes means for removing heat from said compressed refrigerant.

10. An environmental control system according to claim 9, wherein additional external air is supplied to said loop and said heat removing means comprises a condenser for receiving

said compressed refrigerant from said refrigerant compressing means and for transferring heat from said refrigerant to said additional external air.

11. An environmental control system according to claim 10, wherein said loop further includes means for reducing pressure in said refrigerant exiting said heat removing means.

12. An environmental control system according to claim 11, wherein said pressure reducing means comprises an expansion valve.

13. An environmental control system according to claim 1, further comprising means for delivering said cooled air to a cabin onboard said aircraft.

14. An environmental control system according to claim 13, further comprising means for removing moisture from said external air prior to delivering said cooled air to said cabin.

15. An environmental control system according to claim 14, wherein said moisture removing means comprises a water separator.

16. A method for delivering cooled air at a desired pressure to a compartment on an aircraft comprising the steps of:

providing an air compressor;

inputting air external to said aircraft into said air compressor and compressing said external air;

cooling said external air after said external air exits said air compressor; and

delivering said cooled external air to said compartment.

17. A method according to claim 16, further comprising removing moisture from said cooled external air prior to delivering said cooled external air to said compartment.

18. A method according to claim 16, wherein said cooling step comprises providing a refrigerant loop having an evaporator through which a refrigerant flows and passing said compressed external air through said evaporator and transferring heat from said compressed external air to said refrigerant.

19. A method according to claim 18, further comprising compressing said refrigerant exiting said evaporator using a refrigerant compressor.

20. A method according to claim 19, further comprising providing a turbine, bleeding air from an engine to drive said turbine, and driving both said air compressor and said refrigerant compressor using said turbine.

21. A method according to claim 19, further comprising providing said loop with heat removal means, supplying additional external air to said heat removal means, and transferring heat from said compressed refrigerant to said additional external air by passing said compressed refrigerant through said heat removal means.

22. A method according to claim 21, further comprising reducing pressure of said refrigerant exiting said heat removal means and passing said refrigerant at said reduced pressure to said evaporator.

23. A method according to claim 16, wherein said delivering step comprises delivering said cooled external air to a cabin onboard said aircraft.